

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of:	)	
	)	
Promoting More Efficient Use of Spectrum	)	
Through Dynamic Spectrum Use	)	ET Docket No. 10-237
Technologies	)	
	)	

**COMMENTS OF  
THE NATIONAL PUBLIC SAFETY TELECOMMUNICATIONS COUNCIL**

The National Public Safety Telecommunications Council (NPSTC) submits these Comments in response to the Commission’s Notice of Inquiry (NOI) released November 30, 2010 in the above-captioned proceeding.<sup>1</sup> In that proceeding, the Commission seeks comment on the ways in which dynamic spectrum access technology can promote more intensive and efficient use of the radio spectrum. In particular, the NOI raises questions about the application of dynamic spectrum access within the public safety spectrum and questions whether such equipment can be deployed seamlessly and replace existing public safety radios. As addressed in the comments herein, NPSTC supports the overall inquiry regarding dynamic spectrum access technologies and believes there are a number of open questions that must be addressed before such technologies are deployed in public safety spectrum. To the extent DSA technology is trialed in public safety spectrum, it should be deployed by the public safety community to provide a full evaluation of any benefits or issues with respect to operational requirements and potential interference.

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<sup>1</sup> *Promoting More Efficient Use of Spectrum Through Dynamic Spectrum Use Technologies* Notice of Inquiry, ET Docket No. 10237, released November 30, 2010.

## **The National Public Safety Telecommunications Council**

The National Public Safety Telecommunications Council is a federation of public safety organizations whose mission is to improve public safety communications and interoperability through collaborative leadership. NPSTC pursues the role of resource and advocate for public safety organizations in the United States on matters relating to public safety telecommunications. NPSTC has promoted implementation of the Public Safety Wireless Advisory Committee (PSWAC) and the 700 MHz Public Safety National Coordination Committee (NCC) recommendations. NPSTC explores technologies and public policy involving public safety telecommunications, analyzes the ramifications of particular issues and submits comments to governmental bodies with the objective of furthering public safety telecommunications worldwide. NPSTC serves as a standing forum for the exchange of ideas and information for effective public safety telecommunications.

The following 15 organizations participate in NPSTC:

- American Association of State Highway and Transportation Officials
- American Radio Relay League
- Association of Fish and Wildlife Agencies
- Association of Public-Safety Communications Officials-International
- Forestry Conservation Communications Association
- International Association of Chiefs of Police
- International Association of Emergency Managers
- International Association of Fire Chiefs
- International Municipal Signal Association
- National Association of State Chief Information Officers
- National Association of State Emergency Medical Services Officials
- National Association of State Foresters
- National Association of State Technology Directors
- National Emergency Number Association
- National Sheriffs' Association

Several federal agencies are liaison members of NPSTC. These include the Department of Homeland Security (the Federal Emergency Management Agency, the Office of Emergency Communications, the Office of Interoperability and Compatibility, and the SAFECOM Program);

Department of Commerce (National Telecommunications and Information Administration); Department of the Interior; and the Department of Justice (National Institute of Justice, CommTech Program). NPSTC has liaison relationships with associate members, the Telecommunications Industry Association, the Canadian Interoperability Technology Interest Group and the Utilities Telecom Council.

### **NPSTC Comments**

The NOI on dynamic spectrum access technologies indicates that the Commission's objective is to "identify how to make the most efficient use of spectrum to help meet the demand for wireless broadband services, as well as many other applications, under both licensed and unlicensed regulatory approaches."<sup>2</sup> The many questions in the NOI underscore the nascent nature of dynamic spectrum access technologies and their use.

For example, the NOI raises many questions about the various types of technologies that fall under the umbrella of dynamic spectrum access. It also questions the appropriate propagation model assumptions to use when applied in the more complex mobile environment, vs. the fixed environment. The Commission also notes the potential for interference and complexity when applied in bands that may have dissimilar power levels and antenna heights from new operations added into already occupied bands. In addition, the Commission states:

We believe that more experience with these types of radios is needed before they gain widespread acceptance by spectrum users. Dynamic radios have demonstrated that they can successfully identify available spectrum and avoid causing harmful interference to other spectrum users under certain conditions. However, it appears that further work is needed to show that the technology will function as intended under actual usage conditions in a broad array of radio environments without causing harmful interference to existing spectrum users.<sup>3</sup>

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<sup>2</sup> Notice of Inquiry at paragraph 17.

<sup>3</sup> Notice of Inquiry at paragraph 18.

NPSTC agrees with the Commission's assessment. It is clear from the NOI that while DSA may hold much promise, there is also a significant amount of information yet to be learned about how the technology will work in actual practice and in particular, how well it could protect licensed users from interference in a variety of operational environments. For example, given the Commission's primary objective of the DSA initiative is to help meet the demand for wireless broadband, it is not at all clear how DSA technologies would protect the many public safety narrowband operations in use in today's spectrum.

State of the art broadband technology typically uses channels at least 5 MHz wide. Therefore, a 5 MHz paired swath of spectrum would overlap four hundred 12.5 kHz narrowband channel pairs. Furthermore, in most bands, public safety does not even have the benefit of 5+5 MHz of spectrum. For example, in the 20 MHz of spectrum that comprises the 450-470 MHz band, public safety has a total of only 3.7 MHz. That 3.7 MHz is not contiguous and is made up of multiple slivers of spectrum across the band. The remaining 16.3 MHz of the 450-470 MHz band supports critical enterprise and business functions, personal radio services licensed under part 95 of the Commission's rules and some commercial channels licensed under Part 22 of the rules.

Accordingly, for any DSA technology to enable access to a broadband channel, it would have to navigate successfully without interfering across hundreds of narrowband channels distributed across multiple licensees, deployed at multiple locations under different services with different power levels governed by multiple parts of the Commission's rules. While NPSTC certainly supports the provision of new technology, at this time it is not clear what, if any, DSA mechanism would actually allow this to occur without impacting incumbent operations.

The Commission also addresses public safety specifically in the NOI:

*Use of Dynamic Spectrum Access Radios by the Public Safety Community.* We believe that there may be considerable opportunity for dynamic spectrum access radios to be used by the public safety community and within public safety frequency bands. We also note the potential for reconfigurable radios to alleviate many of the interoperability issues associated with public safety spectrum use. Additionally, we observe that many public safety radios currently rely on an older push-to-talk (PTT) protocol. Can dynamic spectrum access radios be deployed in a seamless manner to replace existing public safety radios, including PTT radios? If such a process would not be seamless, are there some public safety bands that would be better candidates than others for an initial transition to dynamic spectrum access radios? We seek comment on all issues related to the potential use of dynamic spectrum access radios by the public safety community and within public safety frequency bands.<sup>4</sup>

NPSTC supports Commission initiatives to improve spectrum efficiency, as long as those initiatives result in continued or improved overall ability to meet public safety's operational communications requirements in the multiple environments in which we communicate. That entails the need to ensure that 1) capacity for public safety operations is maintained and immediately available; 2) interference does not occur as a result of deploying a new technology; 3) any new technologies, equipment or services meet public safety operational requirements in multiple environments and not just consumer needs; and 4) any technology migration is properly funded.

Once the technology is more mature, use of dynamic spectrum access for public safety would need to meet those basic criteria to be fully considered by the public safety community. It appears that while there is early activity regarding development of the DSA technology, there is likely a significant time gap between testing of the technology in the laboratory and the availability of off-the shelf products that would meet public safety's unique requirements. At this early stage of the dynamic spectrum access technology, there are so many open questions that it is difficult for

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<sup>4</sup> Notice of Inquiry at paragraph 54.

NPSTC to either confirm or deny the Commission's belief that dynamic spectrum access provides considerable opportunities for public safety.

The NOI points out a number of experiments that are taking place with various flavors of dynamic spectrum access technology. NPSTC looks forward to the results of these experiments. Given the nature of public safety's mission, NPSTC believes that any testing regarding the deployment of dynamic spectrum access technology within public safety bands would need to be tightly controlled to avoid interference to safety-of-life communications. Such testing would also need to be conducted and evaluated by public safety practitioners for potential public safety use.

Significant testing of dynamic spectrum access technology would need to be conducted and its benefits proven in the variety of operational environments public safety faces for DSA to be considered on a more routine basis. For example, police officers, firefighters and EMS professionals often have fractions of a second to make a decision and start to act. How quickly could a DSA radio determine the locations for all public safety users that need to communicate with one-another for a given operational scenario, assess the specific spectrum available at each of those locations and establish the communications link across the entire group? What happens if another user across town needs to join the communications link but the spectrum is already being used at that new location? How would DSA technology allow unit-to-unit communications on a fire ground without any infrastructure? How would an "emergency call button" function be accommodated with DSA radios?<sup>5</sup> These are just a few of the operational questions that come to mind for public safety to consider the use of DSA technology.

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<sup>5</sup> A number of public safety radios today have an emergency call button which the user can depress in life threatening situations when needed. When a public safety user activates the emergency call button, the spectrum channel being used is held for the duration of the emergency use, even when the radio is dekeyed as multiple transmissions back and forth occur. This assures that a communications channel is available for the emergency.

NPSTC believes it is premature to answer the Commission’s question whether dynamic spectrum access radios could replace existing public safety radios. First, NPSTC is unaware of the existence of any actual dynamic spectrum access radios commercially available and built to public safety standards for operation in public safety bands. Therefore, it is not clear how DSA would improve rather than hamper interoperability. Second, depending on which dynamic spectrum access approach proved to be most reliable, its use may require new infrastructure, not just DSA radios. In summary, the overall costs, benefits and any operational impact of equipment replacement would have to be weighed with far more rigor than a simple opinion that DSA radios provide public safety significant opportunities.

The Commission states that current public safety radios are built on the “older push-to-talk (PTT ) protocol.” That technology is still in use for a reason—it is specifically designed to address public safety requirements for mission critical voice operations. There is certainly a concern that interoperability is not shared across all public safety agencies and jurisdictions nationwide with current systems, but a key root of that problem is the history of spectrum allocations made for public safety, which spans many bands.

Radios have recently become available that can operate over multiple public safety bands, but given their recent introduction, a relatively small percentage of the overall radios deployed by public safety today have multi-band capability. Fortunately, these multiband radios can be added to systems that also continue to utilize single band radios already deployed. If DSA radios were actually available, it is not clear whether all radios in a system would need to be replaced or if DSA radios could operate effectively mixed in with the significant imbedded investment of current radios. Clearly, any wholesale changeout needed for the deployment of DSA technology would

require substantial funding be made available at minimum and likely would also involve significant disruption.

Given the nascent level of maturity of dynamic spectrum access and the many unanswered questions regarding the use of DSA technology, NPSTC believes the primary focus of the public safety community at this time is best placed on advancing deployment of broadband LTE technology in the 700 MHz band. As the Commission is aware, the public safety community is united in its support of implementing new broadband technology based on the commercial LTE standard and looks forward to the reallocation of the D block spectrum so sufficient capacity can be made available for public safety in the same band for high speed data and video applications that LTE supports.

Broadband will help improve interoperability and will provide public safety agencies the means to share mobile high speed data and video information on a wide area basis, i.e., capabilities not feasible on its current spectrum. In addition, U.S. commercial broadband deployment of LTE in nearby 700 MHz spectrum will significantly ramp up the economies of scale for LTE technology chipsets, enabling more economical public safety devices. At some point yet to be determined, LTE may also support mission critical voice operations. However, the timing of the potential advancement of the LTE standard, the availability of actual equipment and the deployment of sufficient broadband coverage to support the operations served today by the “older push-to-talk (PTT) protocol” as referenced in the NOI is not yet defined.

Given the Commission is still at the Notice of Inquiry stage in the DSA proceeding, it is not clear when DSA equipment may become commercially available. Experience with broadband also shows the multi-year process in which public safety must engage for new technology. Public safety and the Commission have been working together to establish the regulatory structure and rules for new broadband systems since early 2006, i.e., already approximately 5 years. Final



rules are yet to be decided and adopted and significant 700 MHz band LTE broadband system deployment must occur. NPSTC is hopeful that Congressional and Commission decisions can be concluded this year so full deployment can move forward.

Accordingly, public safety cannot at this time afford to divert its attention from broadband systems at 700 MHz to provide focus on what appears to be relatively immature DSA technology. Once the DSA technology advances to the point that operational impacts can be better understood, NPSTC and the public safety community will be happy to engage further in the DSA dialogue.

### **Conclusion**

NPSTC looks forward to the further development of dynamic spectrum access technology and ultimately, commercially available equipment using tested and proven DSA techniques. However, given the nascent nature of the technology, it is premature to declare it viable for public safety use. NPSTC believes that any testing of DSA technologies in the public safety spectrum should be conducted by and for the public safety community. The viability of DSA equipment for public safety hinges largely on its implementation without interference and on how well it can meet public safety operational requirements. However, for the near-term, public safety's primary focus is on the finalization of rules and deployment of 700 MHz band LTE broadband systems for which equipment is already standardized, being developed and is significantly more mature than dynamic spectrum access experimental technologies.

Respectfully submitted

A handwritten signature in dark ink, appearing to read "Ralph A. Haller", with a long horizontal flourish extending to the right.

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